

## B. Causes of Cancer

1. Cancer occurs due to mutations or changes to the DNA that control production of proteins including proteins that regulate the cell cycle

C. Carcinogens - substances and agents that are known to cause cancer

## III Apoptosis - programmed cell death

A. Most apoptosis generally occurs by a cell shrinking through a process of "programmed death"

1. Process can help protect organisms from developing cancer

## IV Stem cells - unspecialized cells that can develop into specialized cells under the right condition

A. Two basic types: embryonic & adult

1. Embryonic cells - derived from inner cell mass of a blastocyst; controversial research due to the source of the cells (from embryos)

→ see Figure 21, p. 520

2. Adult stem cells - from bone marrow; have less potential to

develop into as many cell types;  
research less controversial

→ see Figure 22 p. 521